

NOTEBOOK SECTION

3.3-33

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KMS11-A/B
COMMUNICATIONS PROCESSOR
OPTION DESCRIPTION
YM-C136C-00

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Computer Special Systems

NASHUA

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TABLE OF CONTENTS

1	INTRODUCTION	1-1
1.1	General Description	1-1
1.1.1	KMC11 Microprocessor	1-3
1.1.2	DMS11 Line Unit	1-3
1.1.3	DM11-BA Modem Control Multiplexor	1-3
1.1.4	H317-M Distribution Panel	1-3
1.2	General Operation	1-3
1.3	Specifications	1-4
1.4	Descriptions	1-5
2	INSTALLATION	2-1
2.1	Site Considerations	2-1
2.2	Grounding Considerations	2-1
2.3	KMS11 Installation	2-2
2.3.1	H317-M Distribution Panel Installation	2-2
2.3.2	System Unit Installation	2-2
2.3.3	Module Installation	2-3
2.3.3.1	KMC11 Microprocessor	2-3
2.3.3.2	DMS11 Line Unit Installation	2-7
2.3.3.3	DM11-BA Modem Control Multiplexor	2-9
2.4	Field Checkout and Acceptance Procedure	2-12
2.5	Related Literature	2-13
3	OPERATION AND PROGRAMMING	3-1
3.1	General	3-1
3.2	KMS11 Address Assignment	3-1
3.3	KMS11 Vector Assignment	3-1
4	THEORY OF OPERATION	4-1
4.1	General	4-1
5	MAINTENANCE	5-1
5.1	General	5-1
5.2	Special Tools and Test Equipment	5-1
5.3	Diagnostic Software	5-1
5.4	Preventative Maintenance	5-2
5.5	Corrective Maintenance	5-2
5.5.1	General Procedure	5-2
5.5.2	KMC11 and DMS11 Diagnosis	5-3
5.5.3	DM11-BA Diagnosis	5-5
6	CSS SUPPLIED PARTS	6-1
6.1	CSS Parts	6-1
A	SHIPPING/ACCESSORIES LIST	A-1
A.1	Equipment Furnished	A-1
A.2	Equipment Furnished (con't)	A-2
Figures		
1-1	Single-line KMS11	1-1
1-2	Eight-line KMS11	1-2
2-1	KMC11 Address Selection	2-3
2-2	KMC11 Vector Selection	2-4
2-3	Four-slot System Unit	2-5
2-4	Nine-slot System Unit	2-6

2-5	DMS11 to H317-M Cabling	2-8
2-6	DM11-BA Address Selection	2-9
2-7	DM11-BA Vector Selection	2-10
2-8	DM11-BA to H317-M Cabling	2-11
5-1	KMC11 and DMS11 Diagnosis	5-4
5-2	DM11-BA Diagnosis	5-6

Tables

5-1	KMS11 Diagnostic Software	5-2
6-1	CSS Supplied Parts	6-1

CHAPTER 1

INTRODUCTION

1.1 GENERAL DESCRIPTION

The KMS11-A/B is an intelligent communications interface for use on PDP-11 systems. Synchronous protocols at speeds in excess of one megabaud are supported by the KMS11; versions include a single-line interface and an eight-line multiplexor.

The single-line interface, illustrated in Figure 1-1, includes a KMC11 Microprocessor and a DMS11 Line Unit. A cable is provided with the option for connection to a modem.

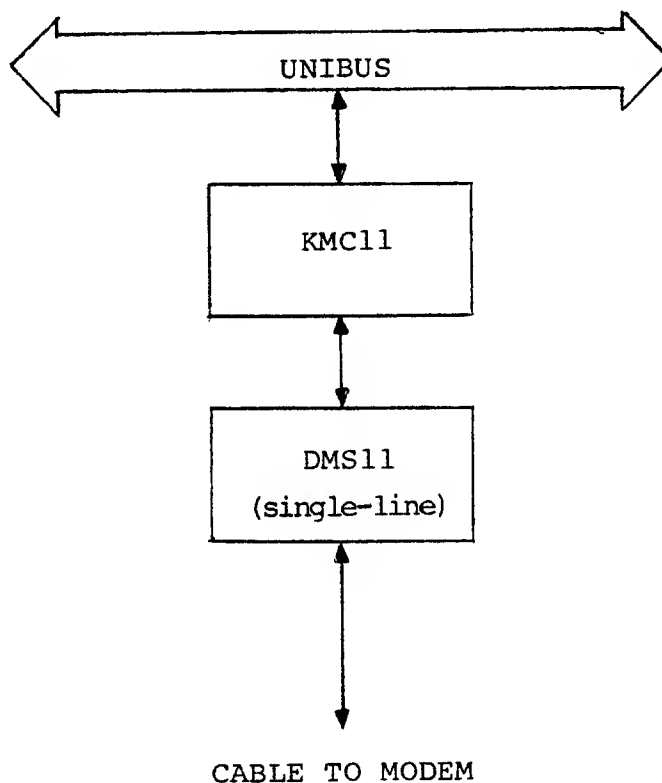


Figure 1-1 Single-line KMS11

The eight-line version of the KMS11, (Figure 1-2), consists of a KMC11 Microprocessor, a DMS11 Line Unit, an H317-M Distribution Panel and an optional DM11-BA Modem Control Multiplexor.

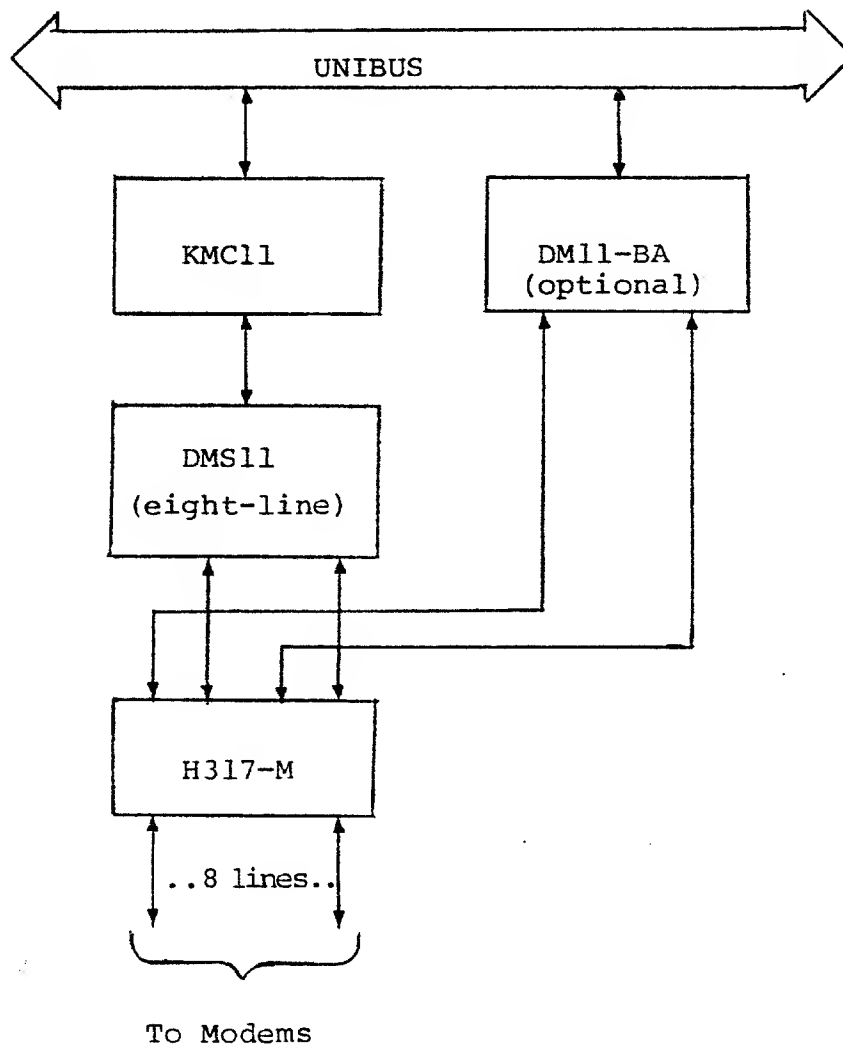


Figure 1-2 Eight-line KMS11

1.1.1 KMC11 Microprocessor

The KMC11 is a discrete component microprocessor, with an instruction set optimized for high speed data transfer. This hex-sized module contains, in addition to the microprocessor logic, random access memory for program and data storage, Unibus interface circuitry and a parallel I/O port for connection to the sepearte line unit.

1.1.2 DMS11 Line Unit

The DMS11 Line Unit is a KMC11-controlled device. Universal Synchronous Receiver/Transmitter (USYNR/T) chip(s) on the line unit preform the serial-parallel conversion required between the KMC11 Microprocessor and a serial communications line. Logic on the hex-sized DMS11 interfaces the USYNR/T to the KMC11 I/O port, while RS-423 compatiable drivers and receivers (for data and clocks) condition the USYNR/T to the serial line. Presently available DMS11's include single and eight-line units.

1.1.3 DM11-BA Modem Control Multiplexor

The optional DM11-BA, included with certain variations of the eight-line KMS11, is an eight-line Modem Control Multiplexor. Control leads from up to eight synchronous modems may be connected to the DM11-BA's RS-423 drivers and receivers through the H317-M Distribution Panel. The hex-sized module contains circuitry to interface to the Unibus, plus logic to scan and sample each line for transitions, i.e., a change in modem status.

1.1.4 H317-M Distribution Panel

Connection between the multiline KMS11 and modems is made through the H317-M Distribution Panel. Eight EIA standard 25-pin connectors on the H317-M provide access to all signals for a given line from both the DMS11 Line Unit and the DM11-BA Modem Control.

1.2 GENERAL OPERATION

The KMC11 micro-program (firmware) is loaded into the KMC11 via the PDP-11 host computer. The firmware directs the KMC11 to set up and control the USYNR/T(s), and thus the serial line in a prescribed manner. Both the format in which data and control characters are sent and received, and the protocol being used may be changed by running different firmware in the KMC11. This allows the same KMS11 hardware to run multiple communications protocols.

1.3 SPECIFICATIONS*

- a. Mechanical:
- | | |
|---------------------------|------------------------------------------------------------|
| Mounting Requirements | Space for 4 or 9-slot system unit, DD11 type. |
| H317-M Distribution Panel | 13.125 cm by 47.5 cm (5.25 in. by 19.0 in.) of rack space. |
- b. Operational Environment:
- | | |
|-------------------|------------------------------|
| Class B | |
| Temperature | 10°C to 40°C (50°F to 104°F) |
| Relative Humidity | 10% to 90% |
| Maximum Wet Bulb | 28°C (82°F) |
| Minimum Dew Point | 20°C (36°F) |
- c. Electrical:
- | | |
|-----------------|-----------------------------------------------------|
| Logic | TTL |
| Interface | RS-232, RS-423, MIL-188-114 |
| Power (Maximum) | + 5 Vdc @ 14.5A
+15 Vdc @ 2.0A
-15 Vdc @ 1.0A |
- d. Unibus
- | | |
|------------------|------------------------------------------------|
| Unibus Loads | 2 (1 for versions without modem control.) |
| Addresses | KMC11: 760010-760016
DM11-BA: 760500-760502 |
| Vectors | KMC11: 310-314
DM11-BA: 300 |
| Interrupt Levels | KMC11: BR5, NPR
DM11-BA: BR4 |

NOTE

1. Addresses and vectors are switch selectable within the floating address and vector space.
2. Detailed specifications for each module may be found by referencing the appropriate option description, as listed in Paragraph 2.5, Related Literature.

*Specifications are subject to change without notice.

1.4 DESCRIPTIONS

KMS11-AF	Eight-line communications multiplexor with no modem control. KMC11-A, DMS11-DA (CRC16), H317-M, four-slot system unit and interconnecting cables.
KMS11-AJ	Single-line communications interface. KMC11-A, DMS11-A (CRC-32), four-slot system unit. BC05C cable to modem.
KMS11-AK	Same as KMS11-AJ, except DMS11-AA (CRC-16).
KMS11-BD	Eight-line communications multiplexor with distribution panel and modem control. Space for eight more lines. KMC11-B, DMS11-DA (CRC-16), DM11-BA, H317-M, nine-slot system unit. Cables to interconnect modules and distribution panel.
KMS11-BE	Eight-line expansion for KMS11-BD. Includes KMC11-B, DMS11-DA (CRC-16), DM11-BA, H317-M and interconnecting cables.
KMS11-BF	Eight-line communications multiplexor with no modem control. KMC11-B, DMS11-DA (CRC16), H317-M, four-slot system unit and interconnecting cables.
KMS11-BH	Same as KMS11-BF, except DMS11-D (CRC 32).
KMS11-BJ	Same as KMS11-AJ, except KMC11-B.
KMS11-BK	Same as KMS11-AK, except KMC11-B.

CHAPTER 2

INSTALLTION

2.1 SITE CONSIDERATIONS

The KMS11 option requires space for mounting either a four or nine-slot system unit (variation dependent) in a BA11-L, F, K, or P Expander Box.

CAUTION

The KMS11-BD with the KMS11-BE expansion requires a dedicated H7441 (+5 Vdc @ 32A) regulator. When mounted in a BA11-F Expansion Box, a special power harness is also required. Consult Computer Special Systems (CSS), Nashua, N.H., for this configuration.

The H317-M Distribution Panel requires a 5.25-inch by 19-inch rack mounting space, and should be mounted within a 10-foot cable length of the modules in the expander box. Should other lengths be required, they may be seperatly ordered.

The KMS11 is designed for operation in a Class B enviroment. Refer to Paragraph 1.3, Specifications, for particulars.

2.2 GROUNDING CONSIDERATIONS

There are several grounding options available on the H317-M Distribution Panel, for each of the eight 25-pin EIA connectors. The various configurations are listed below, with the normal arrangement first:

1. Pin 1 (EIA Protective Ground) and Pin 7 (EIA Signal Ground) connected directly to Circuit/Frame Ground.

2. Pin 1 and Pin 7 connected to Circuit/Frame Ground through a 100-ohm resistor, per RS-449.
3. Pin 1 connected to Circuit/Frame Ground and Pin 7 isolated from Circuit/Frame Ground.

Refer to H317-M Print Set YM-C136B-00, Drawing Number D-UA-5414070-0-0 for jumper location.

2.3 KMS11 INSTALLATION

After unpacking, check the shipment for agreement with the shipping list (Appendix A), and inspect for damage.

2.3.1 H317-M Distribution Panel Installation

Install the H317-M Distribution Panel (not included with KMS11-AJ, AK, BJ or BK) in the cabinet. Configure ground jumpers as required; ensure jumpers W1-W8 are inserted for checkout procedure (Paragraph 2.4). After checkout, and before connecting any external device to the Distribution Panel, it may be necessary to remove the jumper associated with that connector, i.e., if the external device (modem, etc.) is connected to pin 24 of the EIA connector.

NOTE

Jumpers W1-W8 must be installed to run the KMS11 diagnostics externally looped back through the H317-M Panel.

2.3.2 System Unit Installation

Mount the system unit, connecting the power harness to the most convenient power distribution connectors.

If the KMS11-BD variation (nine-slot system unit) with the KMS11-BE expansion is being installed, or if the KMS11-BE expansion is being added to a previously installed KMS11-BD, check to ensure the following:

1. The regulator supplying power to the backplane is an H7441.

2. No backplane, other than the KMS11-BD, is deriving power from the H7441.

Bus the Unibus into the system unit with the M9202 supplied.

2.3.3 Module Installation

2.3.3.1 KMC11 Microprocessor -

To install the KMC11, perform the following procedure. Refer to Chapter 3, Operation and Programming, for a description of address and vector assignments.

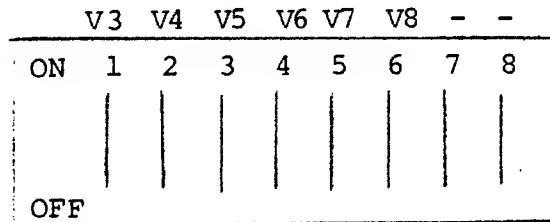
1. Ensure that the priority insert (Level 5 supplied) is properly seated in its socket.
2. Set the switches located at position E125 for module M8206 (E116 for M8204) so that the module will respond to its assigned address. When a switch is OFF (open), a binary 1 is decoded; when ON (closed), a binary 0 is decoded. Note that the switch labeled "1" (Figure 2-1) corresponds to address bit 3; "2" to address bit 4, "3" to address bit 5, etc.

	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
ON	1	2	3	4	5	6	7	8	9	10
OFF										

ADDRESS: 760000 - A12 thru A3 ON
 760010 - A12 thru A4 ON A3 OFF
 777770 - A12 thru A3 OFF

Figure 2-1 KMC11 Address Selection

3. Vector selection is accomplished by an 8-position switch located at position E27 on the M8206 module (E65 for M8204). When the switch is OFF (open) a binary 0 is decoded; when ON (closed), a binary 1 is decoded. Note that switch positions labeled "7" and "8" (Figure 2-2) are not used, and that switch "1" corresponds to vector bit 3, "2" to bit 4, etc.



VECTOR	V3	V4	V5	V6	V7	V8
300	OFF	OFF	OFF	ON	ON	OFF
310	ON	OFF	OFF	ON	ON	OFF
.
.
.
700	OFF	OFF	OFF	ON	ON	ON

Figure 2-2 KMC11 Vector Selections

4. Install the KMC11 in the system unit. Refer to Figure 2-3 for the four-slot system unit; Figure 2-4 for nine-slot system unit. Ensure that the NPR Grant Continuity Wire between pins CA1 and CB1 is removed for the slot in which KMC11 is installed.

	4	3	2	1
A	U			U
B	N			N
	I			I
	B			B
	U			U
	S			S
	O			O
	U			U
	T			I
C		D	K	
		M	M	
		S	C	
		1	1	
		1	1	
D	G			G
	7			7
	2			2
	7			7
E				
F				

Figure 2-3 Four-slot System Unit

	9	8	7	6	5	4	3	2	1
A	U N I B U S O U T	* D M 1 1 B A	* D M S 1 1	* K M C 1 1		D M 1 1 B A	D M S 1 1	K M C 1 1	U N I B U S I N
B									
C									
D	G 7 2 7	M 8 6 4 0	M 8 7 1 1	M 8 2 0 6	G 7 2 7	M 8 6 4 0	M 8 7 1 1	M 8 2 0 6	G 7 2 7
E			(YA)			(YA)			
F									

* Mounting for KMS11-BE expansion.
 If not present, install G727
 Grant Continuity Cards in slots
 D6, D7, & D8.

Figure 2-4 Nine-slot System Unit

2.3.3.2 DMS11 Line Unit Installation -

The DMS11 Line Unit is a KMC11-controlled device; there are no Unibus addresses or vectors to be set.

1. Connect the BC11W-10 cables to J1 and J2 (50-pin Berg connectors) of M8711 (or M8711-YA) module as shown in Figure 2-5. If an M7140 (or M7140-YA) single-line DMS11 is being installed, a BC05X-25 cable is connected to J1.

NOTE

Cables are seated with the arrow on the cable connector aligning with the arrow on the module connector.

Ensure that connectors J1 and J2 on module M8711-YA are connected (respectively) to J9 and J11 of the H317-M Distribution Panel.

2. Connect the BC08R-01 cable to J3 (40-pin Berg) of the DMS11.
3. Mount the module in the appropriate slot of the system unit (Figure 2-3 for four-slot system unit; Figure 2-4 for nine-slot system unit). Care should be taken when installing the DMS11 to avoid snagging the cables on the back of the KMC11 module.
4. Connect the BC08-01 cable to the 40-pin Berg connector on the KMC11.

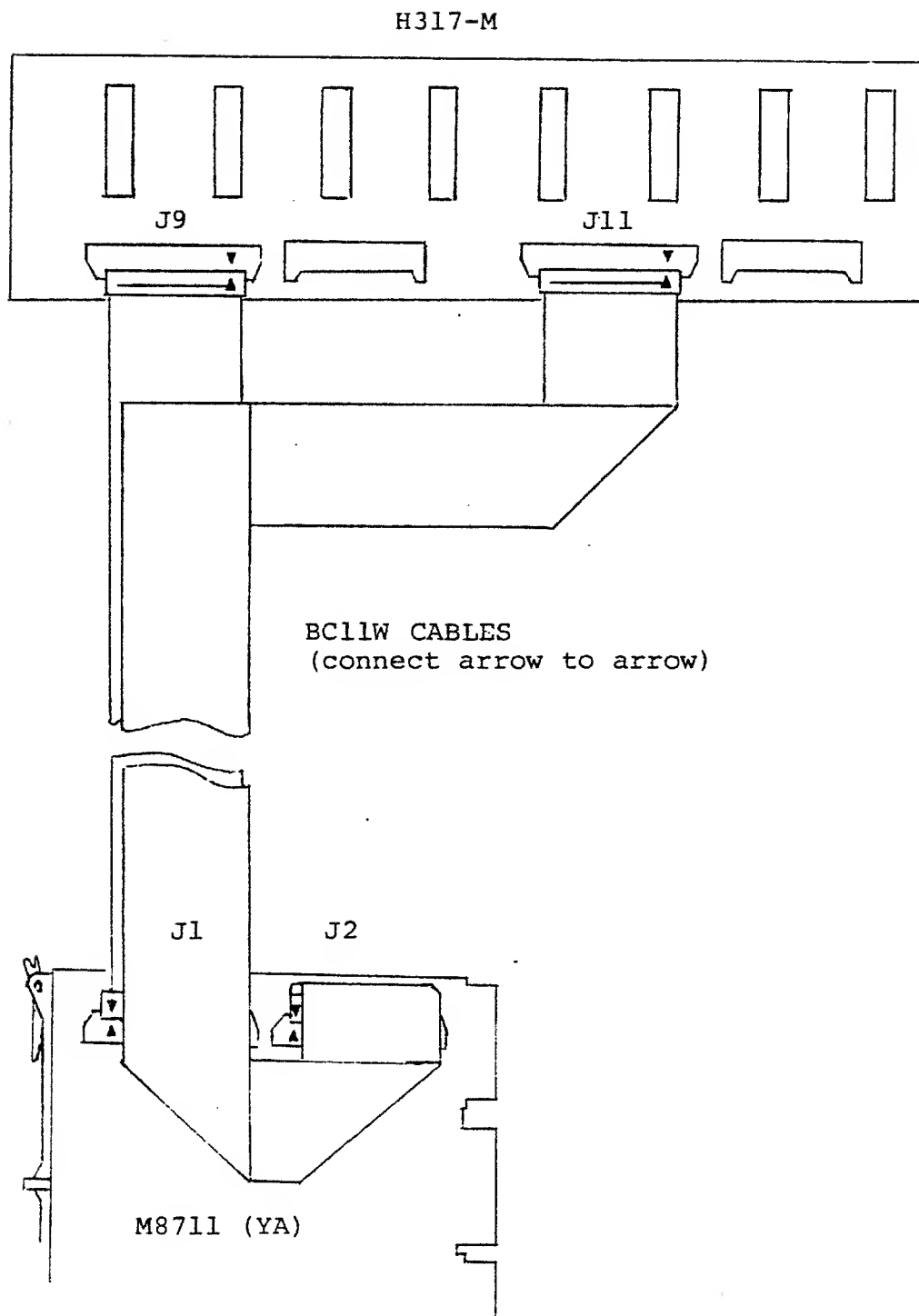


Figure 2-5 DMS11 to H317-M Cabling

2.3.3.3 DM11-BA Modem Control Multiplexor -

The DM11-BA Modem Control Multiplexor is only included with the KMS11-BD and KMS11-BE variations. The following procedure details installation of the DM11-BA (M8640 module). Refer to Chapter 3, Operation and Programming, for a description of address and vector assignments.

1. Ensure that the priority insert (Level 4 supplied) is properly inserted in its socket.
2. Set the switches at location E74, and the jumper W1, so that the module will respond to its assigned address. When a switch is ON (closed), a binary 1 is decoded; when OFF (open), a binary 0 is decoded. Note that the switch labeled "1" corresponds to address bit 3; "2" to address bit 4, etc. Jumper W1 (decoded in the same manner as the switch) corresponds to address bit 2. See Figure 2-6 for address selection.

	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
ON	1	2	3	4	5	6	7	8	9	10
OFF										

ADDRESS: 760000 - A12 thru A3 OFF, W1 OUT
 760004 - A12 thru A3 OFF, W1 IN
 760010 - A12 thru A4 OFF, A3 ON, W1 OUT
 760500 - A12 thru A9, A7, A5 thru A3 OFF
 A8, A6 ON, W1 OUT

Figure 2-6 DM11-BA Address Selection

3. Vector selection is accomplished by an eight-position switch located at position E51 on the M8640 module. When the switch is ON (closed), a binary 0 is decoded; when OFF (open), a binary 1 is decoded. Note that the switch position labeled "8" (Figure 2-7) is not used, and that switch "1" corresponds to vector bit 3, "2" to bit 4, etc.

	V2	V3	V4	V5	V6	V7	V8	-
ON	1	2	3	4	5	6	7	8
OFF								

VECTOR	V2	V3	V4	V5	V6	V7	V8
300	OFF	OFF	OFF	OFF	ON	ON	OFF
304	ON	OFF	OFF	OFF	ON	ON	OFF
310	OFF	ON	OFF	OFF	ON	ON	OFF
.
.
700	OFF	OFF	OFF	OFF	ON	ON	ON

Figure 2-7 DM11-BA Vector Selection

4. Connect the two BC08R-10 cables to the M8640 module and H317-M Distribution Panel as shown in Figure 2-8.

Note that J1 on the M8640 is connected to J10 on the H317-M and J2 is connected to J12. The cables are connected straight through, i.e., without any twist.

5. Mount the M8640 module in the appropriate slot of the system unit.

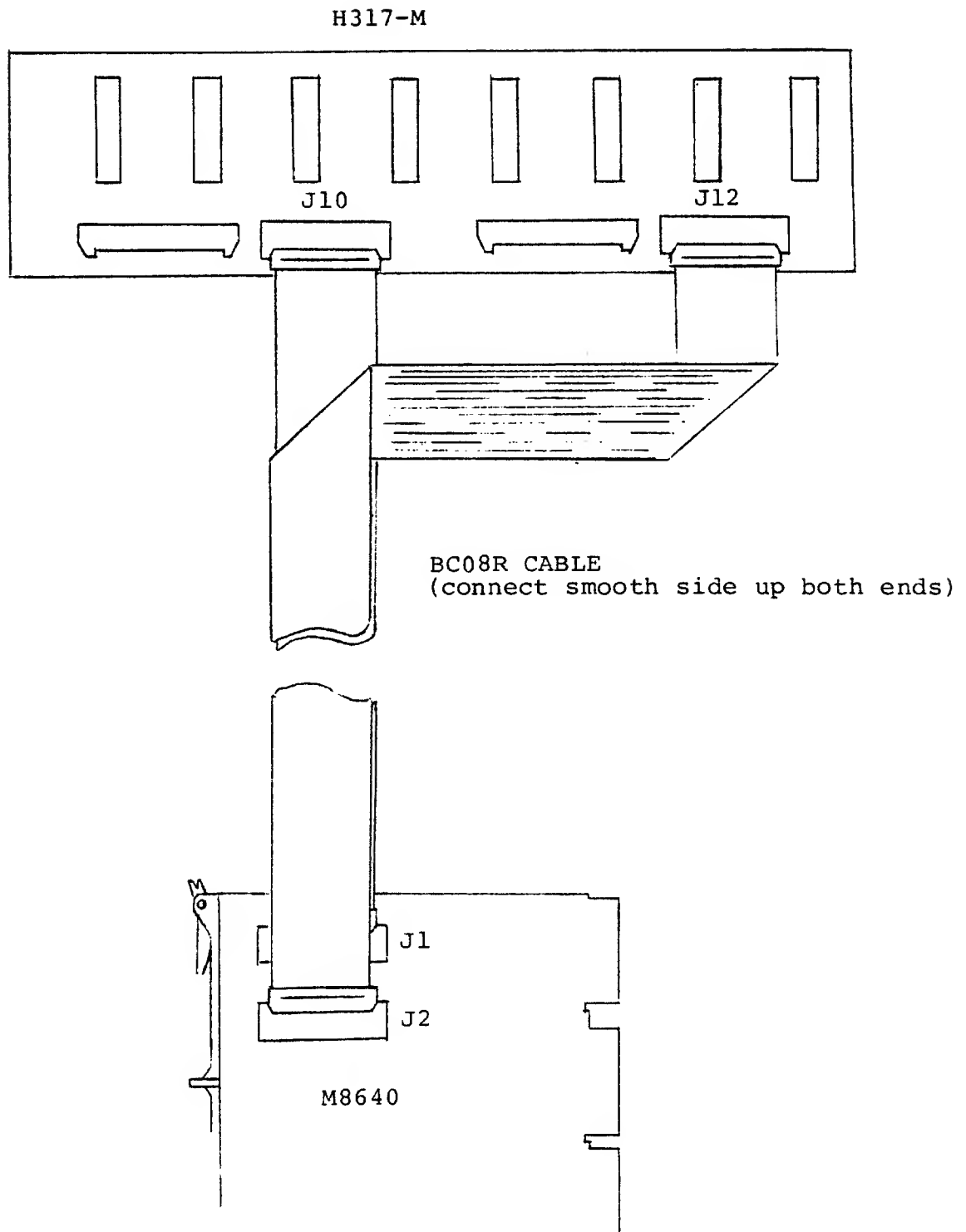


Figure 2-8 DM11-BA to H317-M Cabling

2.4 FIELD CHECKOUT AND ACCEPTANCE PROCEDURE

The following procedure is to be performed for KMS11 checkout and acceptance:

1. Power-up the system. Check +5 Vdc (CA2), +15 Vdc (CV1) and -15 Vdc (CB2) on the installed backplane to ensure that they are present and within tolerance.
2. Load and run the two KMC11 diagnostics, YM-Z093D-A0 and YM-Z093D-B0. Each of these must run for a minimum of 10 error-free passes.
3. Install an H3256 Test Connector on each of the eight lines of the H317-M Distribution Panel; ensure jumpers W1-W8 are also installed.

If the KMS11 variation does not include a Distribution Panel, install Test Connector 2M-E073A on the 50-pin Berg-type connector located on the line unit module.

Load and run the Static Test YM-Z136D-10 and the Dynamic Test YM-Z136D-20. Run the Statuc Test for a minimum of two error-free passes; the Dynamic Test for a minimum of 10.

4. For the KMS11 variations with modem control, load and run the DM11-BA Modem Control diagnostic YM-Z138D-10 for a minimum of 10 error-free passes. Upon successful completion, load and run the DMS11-DM11 Interaction Test YM-Z136D-30 for a minimum of five error-free passes.
5. After the diagnostics have been successfully executed, load and run the DEC-X/11 configuration for the system. It should include the KMC11 DEC-X/11 module YM-Z093D-X0, and for KMS11 variations with modem control, the DM11-BA DEC-X/11 module YM-Z138D-X0.
6. Successful completion of diagnostics and DEC-X/11 configurations, as listed above, constitutes acceptance of this device.

2.5 RELATED LITERATURE

<u>Title</u>	<u>Document Number</u>
DM11-BA Modem Control Multiplexor	YM-C138C-00
DMS11-A Synchronous LTU Option Description	YM-C106C-00
DMS11-D Synchronous Line Unit Option Description	YM-C061C-00
KMC11 Microprocesor Users' Manual	EK-KMC11-OP
KMC11 Programmer's Manual	AA-5244B-TC
KMC11-B Unibus Microprocessor Option Description	YM-C093C-00
PDP-11 Peripherals Handbook	EB-17560-20

CHAPTER 3

OPERATION AND PROGRAMMING

3.1 GENERAL

For a detailed description of the operation and/or programming of the KMS11 components, i.e., the KMC11, the DMS11 or the DM11-BA, refer to Paragraph 2.5, Related Literature.

3.2 KMS11 ADDRESS ASSIGNMENT

Each KMS11 requires four addresses in the floating address space for the KMC11. For KMS11 variations with DM11-BA Modem Control, an additional two addresses are required. The floating address space starts at location 760010 and extends to location 764000 (octal designations). Systems containing other communications options should assign device addresses by option type as follows: DJ11, DH11, DQ11, DU11, DUP11, KK11-A, DMC11, DZ11, KMC11 and DM11-BA. Multiple devices of the same type must be assigned contiguous addresses. It is recommended, however, that a gap of 10 (octal), starting on a module 10 (octal) boundary, be left between the last address of one type of device and the first address of the next.

3.3 KMS11 VECTOR ASSIGNMENT

Each KMS11 requires two vector addresses in the floating vector space for the KMC11. For KMS11 variations with DM11-BA Modem Control, an additional vector address is required. The floating vector address space starts at location 300 and proceeds upward to 777. Vector addresses 500-534, however, are reserved. If other floating vector devices are also included in the system, device vectors should be assigned by device type as follows: DP11, DM11-A, DN11, DM11-BA, DL11-C, D, E, DJ11, DH11, DQ11, DU11, DUP11, DV11, DMC11, DZ11 and KMC11. When any device is not used in a system, vector assignments are moved up to fill the vacancies. Should it be required to add additional devices of the same type to the system, vector address assignment should be contiguous for the same type device; reassignment of other devices presently in the system may be required.

CHAPTER 4

THEORY OF OPERATION

4.1 GENERAL

For a detailed description of the various theories of operation of the KMS11 components, i.e., the KMC11, the DMS11 or the DM11-BA, refer to Paragraph 2.5, Related Literature.

CHAPTER 5

MAINTENANCE

5.1 GENERAL

The maintenance philosophy of the KMS11 is to first disconnect it from any external devices (modems, etc.), after which diagnostic software is employed to isolate the failure. Failing components, i.e., modules, cables, etc., may then be replaced and the system restored to operating status.

5.2 SPECIAL TOOLS AND TEST EQUIPMENT

No special test equipment or tools are required for KMS11 maintenance activities. However, for troubleshooting at the module component level, an oscilloscope (Tektronix 465 or equivalent) and hex-height module extender (W904) are necessary.

5.3 DIAGNOSTIC SOFTWARE

The diagnostic software listed in Table 5-1 is used to verify operation of the KMS11 and associated components. Refer to the appropriate diagnostic listing for an explanation of switch settings, running instructions and error messages.

Table 5-1
KMS11 Diagnostic Software

DEVICE	DIAGNOSTIC	FUNCTION
KMC11	YM-Z093D-A0 YM-Z093D-B0	KMC11 Test - Part 1 KMC11 Test - Part 2
DMS11	YM-Z136D-10 YM-Z136D-20 YM-Z136D-30	Static Test Dynamic Test DMS11-DM11 Interaction Test
DM11-BA	YM-Z138D-10	Modem Control

5.4 PREVENTATIVE MAINTENANCE

There is no specific preventive maintenance interval associated with the KMS11. If standard PM procedures are adhered to, i.e., power supply checks, cleaning, etc., no additional checks need be performed.

5.5 CORRECTIVE MAINTENANCE

5.5.1 General Procedure

It is recommended that diagnosis of KMS11 failures proceed in the following manner:

1. Verify operation of the KMC11 Microprocessor.
2. Verify operation of the DMS11 Line Unit, associated cables and H317-M Distribution Panel.
3. Where applicable, verify operation of the DM11-BA Modem Control module.

Should the failure obviously be with the Modem Control, steps one and two (diagnosing the KMC11 and DMS11) may be omitted.

5.5.2 KMC11 and DMS11 Diagnosis

Disconnect the KMC11 Microprocessor from the DMS11 Line Unit by removing the BC08R-01 cable (Figure 5-1). Load and run the KMC11 diagnostics YM-Z093D-A0 and YM-Z093D-B0, without error, to verify its operation. Upon successful completion, reconnect the BC08R-01 cable.

Disconnect any external cables from the H317-M Distribution Panel. Place an H3256 Test Connector on each of the eight EIA connectors, and ensure that jumpers W1-W8 are installed on the H317-M.

NOTE

If the DMS11 is the single-line version, place the H3256 Test Connector at the end of the cable after disconnecting the cable from any external equipment.

Run the DMS11 Static Test, YM-Z136D-10 in EXTERNAL mode. Should a failure occur, run the diagnostic in INTERNAL mode. If the diagnostic now passes, replace the cables to the H317-M Distribution Panel with the 2M-E044A Test Connectors (2M-E073A for the single-line version), which plug into J1 and J2 on the DMS11. Should the diagnostic pass, the malfunction is either the H317-M or the interconnecting cables. Upon completion of repairs, run the DMS11 Dynamic Test, YM-Z136D-20.

If a Modem Control Multiplexor is provided, proceed to Paragraph 5.5.3, DM11-BA Diagnosis. Otherwise, this completes the KMC11 and DMS11 diagnosis.

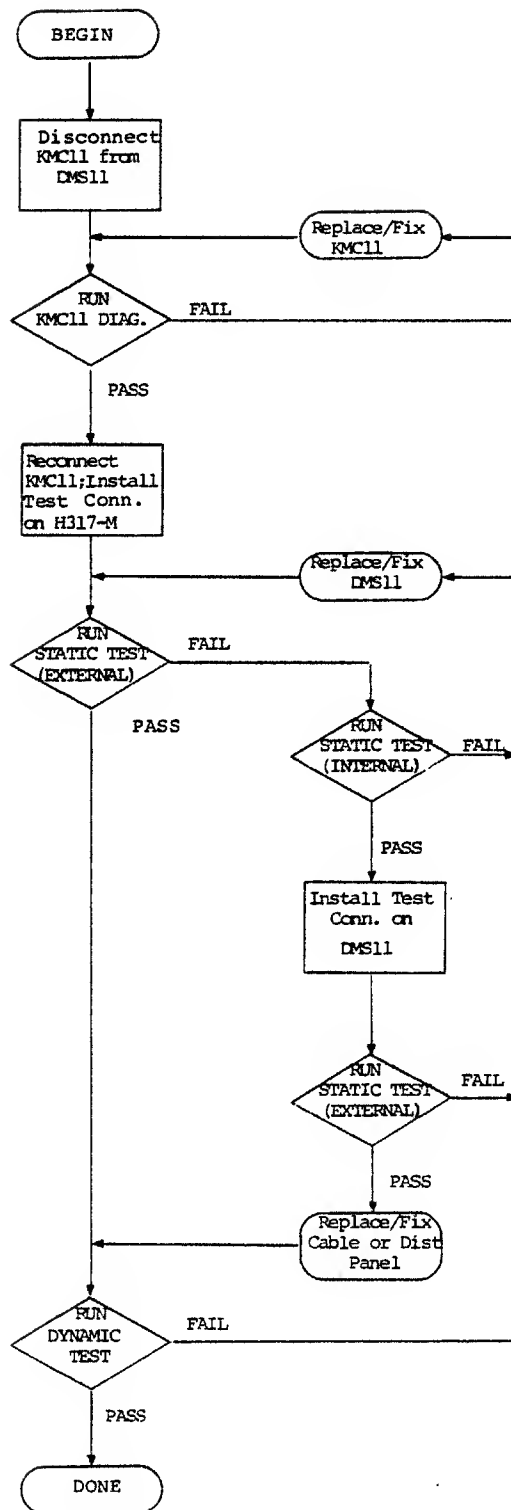


Figure 5-1 KMC11 and DMS11 Diagnosis

5.5.3 DM11-BA Diagnosis

Ensure that eight H3256 Test Connectors are installed on the H317-M Distribution Panel (Figure 5-2). Load and run the DM11-BA Modem Control Diagnostic YM-Z138D-10. Should the diagnostic fail, disconnect the cables to the Distribution Panel at the module and replace them with 2M-E122A Test Connectors. Should the diagnostic now pass, the fault lies with either the Distribution Panel or the interconnecting cables. Upon completion of repairs, run the DMS11-DM11 Interaction Test, YM-Z136D-30. Successful (error-free) test culmination completes the DM11-BA diagnosis.

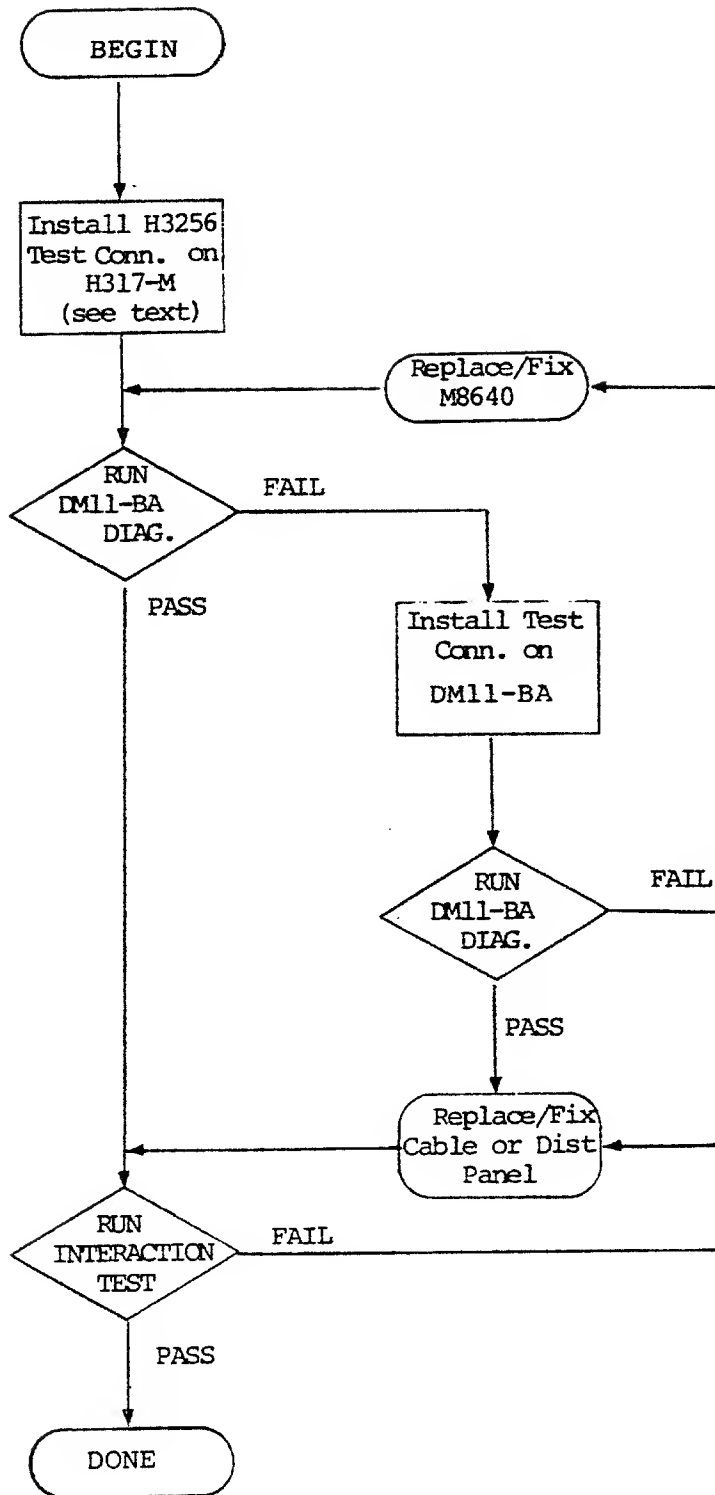


Figure 5-2 DM11-BA Diagnosis

CHAPTER 6

CSS SUPPLIED PARTS

6.1 CSS PARTS

Table 6-1 lists the KMS11-A/B Communications Processor parts which may only be obtained from the CSS manufacturing facilities, Nashua, New Hampshire.

Table 6-1
CSS Supplied Parts

PART NUMBER	DEVICE	DESCRIPTION
M8206	KMC11-B	Microprocessor
M7140	DMS11-A	Single-line Line Unit (CRC32)
M7140-YA	DMS11-AA	Single-line Line Unit (CRC16)
M8711	DMS11-D	8-line Line Unit (CRC32)
M8711-YA	DMS11-DA	8-line Line Unit (CRC16)
M8640	DM11-BA	Modem Control Multiplexor
H317-M		Distribution Panel
H3256		Test Connection (H317-M)
2M-E044A		Test Connector (Eight-line DMS11)
2M-E073A		Test Connector (Single-line DMS11)
2M-E122A		Test Connector (DM11-BA)

A.1 EQUIPMENT FURNISHED

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			QUANTITY / VARIATION														
SHIPPING LIST																	
ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	KMS11-AJ	KMS11-AK	KMS11-BD	KMS11-BE	KMS11-BF	KMS11-BH	KMS11-BJ	KMS11-BK	KMS11-AF						
1	YM-C136C-00	KMS11-A/B Communications Processor Optr. Descrip.	1	1	1	1	1	1	1	1	1						
2	YM-C136B-00	KMS11 Engineering Drawings	1	1	1	1	1	1	1	1	1						
3	EK-KMC11-0P	KMC11 Microprocessor Users' Manual	1	1	-	-	-	-	-	-	1						
4	YM-C093C-00	KMC11-B Unibus Microprocessor Option Description	-	-	1	1	1	1	1	1	-						
5	YM-C066C-00	DMS11-A Synchronous LTU Option Description	1	1	-	-	-	-	1	1	-						
6	YM-C066IC-00	DMS11-D Synchronous Line Unit Option Description	-	-	1	1	1	1	-	-	1						
8	YM-Z093D-A0	KMC11 Diagnostic (Part 1)	1	1	1	1	1	1	1	1	1						
9	YM-Z093E-A0	KMC11 Diagnostic Listing (Part 1)	1	1	1	1	1	1	1	1	1						
10	YM-Z093D-B0	KMC11 Diagnostic (Part 2)	1	1	1	1	1	1	1	1	1						
11	YM-Z093E-B0	KMC11 Diagnostic Listing (Part 2)	1	1	1	1	1	1	1	1	1						
12	YM-Z093D-X0	KMC11 DEC-X/11	1	1	1	1	1	1	1	1	1						
13	YM-Z093E-X0	KMC11 DEC-X/11 Listing	1	1	1	1	1	1	1	1	1						
14	YM-Z136D-10	DMS11 Static Test	1	1	1	1	1	1	1	1	1						
15	YM-Z136E-10	DMS11 Static Test Listing	1	1	1	1	1	1	1	1	1						
16	YM-Z136D-20	DMS11 Dynamic Test	1	1	1	1	1	1	1	1	1						
17	YM-Z136E-20	DMS11 Dynamic Test Listing	1	1	1	1	1	1	1	1	1						
18	YM-Z136D-30	DMS11-DM11 Interaction Test	-	-	1	1	-	-	-	-	-						
19	YM-Z136E-30	DMS11-DM11 Interaction Test Listing	-	-	1	1	-	-	-	-	-						
20	YM-Z138D-10	DM11-BA Modem Control Diagnostic	-	-	1	1	-	-	-	-	-						
21	YM-Z138E-10	DM11-BA Modem Control Diagnostic Listing	-	-	1	1	-	-	-	-	-						
22	YM-Z138D-X0	DM11-BA DEC-X/11	-	-	1	1	-	-	-	-	-						
TITLE			DOCUMENT NUMBER											REV.			
KMS11-A/B Communications Processor			YM-C136C-00											*			

A.2 EQUIPMENT FURNISHED (CON'T)

DIGITAL EQUIPMENT CORPORATION MAYNARD, MASSACHUSETTS			QUANTITY / VARIATION														
SHIPPING LIST			KMS11-AJ	KMS11-AK	KMS11-BD	KMS11-BE	KMS11-BH	KMS11-BF	KMS11-BJ	KMS11-BK	KMS11-AF						
ITEM NO.	DWG NO. / PART NO.	DESCRIPTION															
23	YH-Z138E-X0	DMS11-BA DEC-X/11 Listing	-	-	1	1	-	-	-	-	-						
24	M8204	KMC11-A Microprocessor	1	1	-	-	-	-	-	-	1						
25	M8206	KMC11-B Microprocessor	-	-	1	1	1	1	1	1	-						
26	M7140	DMS11-A Line Unit (1-line - CRC32)	1	-	-	-	-	-	1	-	-						
27	M7140-YA	DMS11-AA Line Unit (1-line - CRC16)	-	1	-	-	-	-	-	1	-						
28	M8711	DMS11-D Line Unit (8-line - CRC32)	-	-	-	-	-	1	-	-	-						
29	M8711-YA	DMS11-DA Line Unit (8-line - CRC16)	-	-	1	1	1	-	-	-	1						
30	M8640	DM11-BA Modem Control Multiplexor	-	-	1	1	-	-	-	-	-						
31	M317-M	Distribution Panel	-	-	1	1	1	1	-	-	1						
32	DD11-DF	Nine-slot System Unit	-	-	1	-	-	-	-	-	-						
33	DD11-CP	Four-slot System Unit	1	1	-	-	1	1	1	1	1						
34	G727	Grant Continuity Card	2	2	6	-	2	2	2	2	2						
35	M9202	Unibus Connector Module	1	1	1	-	1	1	1	1	1						
36	BCD8R-01	Cable	1	1	1	1	1	1	1	1	1						
37	BC08R-10	Cable	-	-	2	2	-	-	-	-	-						
38	BC11W-10	Cable	-	-	2	2	2	2	-	-	2						
39	M3256	Test Connector (M317-M)	-	-	8	8	8	8	-	-	8						
40	2H-E044A	Test Connector (Eight-line DMS11)	-	-	2	2	2	2	-	-	2						
41	2H-E073A	Test Connector (Single-line DMS11)	1	1	-	-	-	-	1	1	-						
42	2H-E122A	Test Connector (DM11-BA)	-	-	2	2	-	-	-	-	-						
TITLE			DOCUMENT NUMBER											REV.			
KMS11-A/B Communications Processor			YH-C136C-00											*			